

In this unit students will plant a Three Sisters Garden, which is a traditional Native American vegetable garden of corn, beans and squash. They will also plant culinary and medicinal herbs including mint, rosemary, dill, and basil. They will harvest their garden herbs and vegetables to make fresh butter and cook a Three Sisters Stew. Key concepts for the unit include 'āina, food miles, food security, companion plants, biodiversity, agriculture, crop varieties, seed selection, seed saving, dependence and self-sufficiency, food processing, community, mindfulness, proper harvesting and food handling, and gardening and culinary arts.

## RECOMMENDED GRADE LEVEL

Grade 5

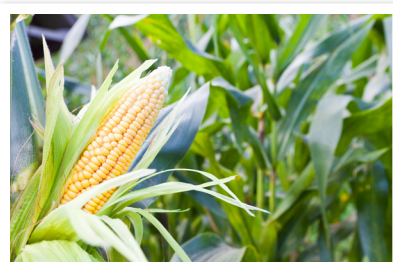
*This unit is easily adaptable for other grade levels.*

## LESSON DELIVERY

This unit consists of four 45-minute lessons to be taught at 3 to 5 week intervals (about one lesson per month) over the course of one semester. Regular garden care and observations should take place between lessons, and teachers are encouraged to use the Lesson Extensions or create their own extension activities in order to connect the gardens with other classroom learning. This unit may be delivered in either the fall or spring.

## GARDEN CARE

- Teachers and students are responsible for watering and weeding their garden. Regular applications of organic nutrients (vermicast) are scheduled as part of each lesson.
- Add **Garden Monitor** to the list of classroom jobs assigned; these students should visit the garden daily to water the soil, check on the gardens, and make observations.
- Set up a shared weekly watering schedule amongst grade level teachers and/or parents and garden docents to make sure the garden receives adequate moisture.
- Please do not use synthetic chemicals (pesticides, herbicides, and/or fertilizers) in or around school and home gardens. If necessary, use "OMRI" (organic certified) products only.
- Post the **Garden Agreements** in the classroom and review them often with students.



## PRE & POST UNIT SURVEYS, TAKE HOME LETTERS, & STUDENT WORKBOOKS

- Pre and Post Unit Surveys measure student progress related to content knowledge, attitudes, and behavior change related to 'ĀINA Lessons.
- Take Home Letters contain suggested questions/activities for each lesson for families to help reinforce, engage, and learn along with their child.
- Student Workbooks include Student Worksheets and Take Home Letters, available for download at [www.kokuahawaiifoundation.org/aina](http://www.kokuahawaiifoundation.org/aina).
- Regular student observation time in the garden is encouraged with the use of individual Garden Journals or Folders, where drawings and writings can be kept by each student, or a Class Journal where weekly garden observations can be recorded by Garden Monitors.
- Plan to review and select examples of student work to be shared with the Kōkua Hawai'i Foundation.

## LESSON EXTENSIONS

Gardens offer infinite, engaging learning opportunities, and teachers are encouraged to utilize them beyond these lessons. The lesson plans include a number of suggested activities (Lesson Extensions) designed for teachers and students to make the most of the gardening experience!

## NEED HELP?

Contact the Kōkua Hawai'i Foundation with any questions or comments about this unit:

- [aina@kokuahawaiifoundation.org](mailto:aina@kokuahawaiifoundation.org)
- (808) 638-5145



## THE THREE SISTERS GARDEN

Lesson 1	Lesson 2	Lesson 3	Lesson 4
<b>Living Plants, Living People</b>	<b>Biodiversity</b>	<b>Self-Sufficiency</b>	<b>Community</b>
<b>SUGGESTED DELIVERY TIMES FOR FALL SEMESTER (3 to 5 weeks apart)</b>			
September	October	November	December
<b>SUGGESTED DELIVERY TIMES FOR SPRING SEMESTER (3 to 5 weeks apart)</b>			
February	March	April	May
<b>LESSON OVERVIEW</b>			
<b>Key Concepts</b> <ul style="list-style-type: none"> <li>• Companion plants</li> <li>• Early American life</li> <li>• Food security and food miles</li> <li>• Medicinal and culinary herbs</li> <li>• Garden Agreements</li> </ul>	<b>Key Concepts</b> <ul style="list-style-type: none"> <li>• Biodiversity</li> <li>• Crop varieties</li> <li>• Seed selection</li> <li>• Seed saving</li> <li>• Garden care</li> </ul>	<b>Key Concepts</b> <ul style="list-style-type: none"> <li>• Dependence and self-sufficiency</li> <li>• Traditional food processing skills</li> <li>• Garden care</li> </ul>	<b>Key Concepts</b> <ul style="list-style-type: none"> <li>• Community</li> <li>• Harvesting</li> <li>• Mindfulness</li> <li>• Celebration!</li> </ul>
<b>Introduction</b> Discuss and act out how the Three Sisters work together in the garden. Imagine early American life, and discuss the benefits of growing more food in Hawai'i. Review the Garden Agreements.	<b>Introduction</b> Discuss the concepts of biodiversity, crop varieties, seed selection, and seed saving. Discuss the important relationship between biodiversity and agriculture.	<b>Introduction</b> Discuss the concepts of dependence and self-sufficiency. Discuss how traditional food processing skills contribute to self-sufficiency.	<b>Introduction</b> Discuss the benefits of working together as a community, where each person has an important task to accomplish. Review tasks and assign students to stations.
<b>Activity 1: Planting</b> Prepare the soil using tools from nature and plant corn seeds. Water the gardens and fertilize with vermicast.	<b>Activities 1-4:</b> Four groups work together to care for the garden and observe biodiversity. Weed, water, and feed the gardens and herbs with vermicast. Mound soil around young corn plants. Add compost (optional). Plant pole bean seeds at the base of corn plants. Plant squash seeds.	<b>Activity 1: Traditional Food-Processing Skills</b> Turn cream into butter and harvest and add fresh herbs from the garden.	<b>Activities 1-6</b> Six groups work together to harvest the garden vegetables and herbs, and wash, chop, and cook them in order to create a Three Sisters Stew.
<b>Activity 2: Medicinal Herbs</b> Study the herb cards and live herb plants and discuss their medicinal properties. Transplant the herbs into the garden.		<b>Activity 2: Garden Care</b> Weed, water, and feed the gardens and herbs with vermicast. Thin plants as needed. Add compost and mulch (optional).	<b>Harvest Party</b> When all the work is finished, students join together to share gratitude and enjoy a delicious and nutritious vegetable stew.
<b>Follow Up Activities</b> <ul style="list-style-type: none"> <li>• Daily garden care and observations</li> <li>• Remove cover cloth when sprouts emerge (if used)</li> <li>• Student Worksheet: Food Miles</li> <li>• Journaling and discussion</li> <li>• Lesson Extensions</li> <li>• Take Home Letter</li> </ul>	<b>Follow Up Activities</b> <ul style="list-style-type: none"> <li>• Daily garden care and observations</li> <li>• Remove cover cloth when sprouts emerge (if used)</li> <li>• Student Worksheet: Crop Varieties</li> <li>• Journaling and discussion</li> <li>• Lesson Extensions</li> </ul>	<b>Follow Up Activities</b> <ul style="list-style-type: none"> <li>• Daily garden care and observations</li> <li>• Remove cover cloth when sprouts emerge (if used)</li> <li>• Student Worksheet: A Real Local Meal</li> <li>• Journaling and discussion</li> <li>• Lesson Extensions</li> </ul>	<b>Follow Up Activities</b> <ul style="list-style-type: none"> <li>• Continue to care for the gardens and harvest vegetables; dry and save seeds</li> <li>• Place mulch over bare soil</li> <li>• Student Worksheet: Garden Reflection</li> <li>• Journaling and discussion</li> <li>• Lesson Extensions</li> <li>• Submit examples of student work to Kōkua Hawai'i Foundation</li> </ul>

## ACADEMIC STANDARDS GUIDE: GRADE 5 ALIGNMENT

Common Core Standards (CCSS), Language Arts		
5.W.1	Writing: Text Types and Purposes: Write opinion pieces on topics or texts, supporting a point of view with reasons and information.	Lessons 2, 3
5.W.2	Writing: Text Types and Purposes: Write informative/explanatory texts to examine a topic and convey ideas and information clearly.	Lesson 2
5.W.3	Writing: Text Types and Purposes: Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.	Lessons 1, 2, 3, 4
5.W.7	Writing: Research to Build and Present Knowledge: Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic.	Lessons 2, 3
5.W.8	Writing: Research to Build and Present Knowledge: Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources.	Lessons 1, 2, 3, 4
5.SL.1	Speaking and Listening: Comprehension and Collaboration: Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.	Lessons 1, 2, 3, 4
5.SL.4	Speaking and Listening: Presentation of Knowledge and Ideas: Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.	Lessons 2, 3
5.SL.5	Speaking and Listening: Presentation of Knowledge and Ideas: Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.	Lessons 2, 3, 4

(Academic Standards Guide continues on page 4)



## ACADEMIC STANDARDS GUIDE: GRADE 5 ALIGNMENT (CONTINUED)

Hawai'i Content & Performance Standards III (HCPS III)		
HE.3-5.1.3	Healthy Eating and Physical Activity: Explain the importance of a healthy diet as part of a healthy lifestyle	Lessons 1, 4
HE.3-5.1.8	Personal Health and Wellness: Describe the relationship between health behaviors and well-being	Lessons 1, 4
SS.5.2.1	Historical Perspectives and Interpretations: Analyze how beliefs and education and/or the society in which a person resides shapes his/her "point of view"	Lessons 1, 2, 3, 4
SS.5.2.2	Historical Empathy: Judge the past in the context of the time instead of imposing present norms and values on historical events	Lesson 1
SS.5.3.1	Exploration, Migration, and Settlement: Identify what Europeans sought and what they found during the Age of Exploration	Lesson 1
SS.5.3.2	Exploration, Migration, and Settlement: Examine the interactions between Europeans and Native Americans in North America	Lesson 1
SS.5.3.3	Exploration, Migration, and Settlement: Describe the hardships experienced by European settlers in colonial America	Lesson 1
SS.5.6.1	Cultural Inquiry: Compare the views of Native Americans and Europeans regarding the relationship between humans and the land	Lessons 1, 2, 3
SS.5.8.1	Limited Resources and Choice: Explain the opportunity costs considered by the settlers before moving to the colonies	Lesson 1

Next Generation Science Standards (NGSS)		
Disciplinary Core Ideas		
5-LS2-1	Develop a model to describe the movement of matter amongst plants, animals, decomposers, and the environment	Lessons 1, 2, 3, 4
Science and Engineering Practices		
Obtaining, Evaluating, and Communicating Information: Communicate solutions with others in oral and/or written forms using models and/or drawings that provide detail about scientific ideas.		Lessons 1, 2
Analyzing and Interpreting Data: Use observations to describe patterns in the natural world in order to answer scientific questions.		Lessons 1, 2
Developing and Using Models: Use a model to represent relationships in the natural world.		Lessons 1, 2, 3, 4
Crosscutting Concepts		
Patterns: Patterns in the natural and human designed world can be observed and used as evidence.		Lessons 1, 2, 3, 4
Systems and System Models: Systems in the natural and designed world have parts that work together.		Lessons 1, 2, 3, 4



## ABOUT 'ĀINA IN SCHOOLS

'ĀINA In Schools is a farm to school initiative that connects children to their local land, waters, and food to grow a healthier Hawai'i. In addition to encouraging the use of locally grown fruits and vegetables in school meals and snacks, the program includes standards-based nutrition, garden, and compost curricula that empower children to grow their own food, make informed food decisions, and reduce waste. 'ĀINA In Schools also provides field trips to local farms, chef cooking demonstrations in classrooms, as well as waste reduction, garden, and cooking educational opportunities for families and community members.



## PUBLISHING INFORMATION

The 'ĀINA In Schools curriculum includes Nutrition Education, Garden-Based Learning, and Waste Reduction lessons for kindergarten through sixth grade students.

All 'ĀINA In Schools curriculum and materials are property of the Kōkua Hawai'i Foundation and are distributed to trained educators for use at schools participating in the 'ĀINA In Schools program. The curriculum and materials may be reproduced for individual classroom use by schools participating in the 'ĀINA In Schools program or by registered users approved by the Kōkua Hawai'i Foundation. Reproduction of the curriculum and materials is not permitted by unregistered users without the express written consent of the Kōkua Hawai'i Foundation.

The registration and training process helps Kōkua Hawai'i Foundation to gather educator feedback on the curriculum and to document how many children and schools are being reached through the lessons. Visit our website to become a registered user, sign up for trainings, and gain access to all Kōkua Hawai'i Foundation curriculum and resource guides. If you receive a copy of the curriculum via other means, we ask that you please email [aina@kokuahawaiifoundation.org](mailto:aina@kokuahawaiifoundation.org) to share your plan for use of the materials. Please direct questions about the 'ĀINA In Schools program and curriculum to [aina@kokuahawaiifoundation.org](mailto:aina@kokuahawaiifoundation.org).

## MAHALO

The Kōkua Hawai'i Foundation thanks the following organizations and individuals who have assisted with the development of the 'ĀINA In Schools curriculum and materials:

- **Kōkua Hawai'i Foundation:** Kaliko Amona, Lydi Morgan Bernal, Sarah Gelb, Kim Johnson, Julius Ludovico, Summer Maunakea, Debbie Millikan, Deanna Moncrief, Kelly Perry, [www.kokuahawaiifoundation.org](http://www.kokuahawaiifoundation.org)
- **The Green House:** Betty Gearen and Tia Meer, [www.thegreenhousehawaii.com](http://www.thegreenhousehawaii.com)
- **GrowingGreat:** Marika Bergsund and Lori Sherman, [www.growinggreat.org](http://www.growinggreat.org)
- **Food for Thought:** Marty Fujita, [www.foodforthoughtojai.org](http://www.foodforthoughtojai.org)

Special thanks to the students, teachers, and volunteers who have participated and taught lessons in previous years and provided their valuable feedback to improve them.

Mahalo nui!



Student Worksheet  
**THREE SISTERS GARDEN**  
Grade 5 \* Pre-Unit Survey

Name .....

School .....

Teacher .....

I have been at this school since grade: K 1 2 3 4 5 (circle one)

*This Pre-Unit Survey is to see what you already know about these topics. It is ok if you don't know any of the answers. You will be learning about these topics this semester. Try your best and have fun!*

1. **The Three Sisters Garden is a gardening method used by Native Americans. Which of these plants make up the Three Sisters Garden? Circle the three plants:**



a. Corn



b. Basil



c. Sweet Potato



d. Squash



e. Peas



f. Lemon



g. Carrots



h. Pole beans

2. **What are the reason(s) for planting companion plants? Circle ALL the correct answers:**

- |                                     |                         |
|-------------------------------------|-------------------------|
| a. Provides nutrients to each other | c. Helps conserve water |
| b. Provides shade                   | d. Repels pests         |

3. **What are the use(s) for herbs? Circle ALL the correct answers:**

- |                      |                    |
|----------------------|--------------------|
| a. Flavoring foods   | d. Keep pests away |
| b. Medicine          | e. Fragrance       |
| c. Food preservation |                    |

4. **Draw a line to match each word to its correct definition:**

- |                     |   |
|---------------------|---|
| a. Biodiversity     | 1. The availability of food and one's access to it                          |
| b. Self-sufficiency | 2. The diversity of life within species, between species, and of ecosystems |
| c. Crop Varieties   | 3. Cultivated forms of plants each bearing certain characteristics          |
| d. Food Security    | 4. Able to supply one's own needs without external assistance               |

5. **Approximately how much of Hawai'i's food is imported from out of state? Circle ONE answer:**

- |            |            |        |            |
|------------|------------|--------|------------|
| a. 10%-15% | b. 25%-30% | c. 50% | d. 80%-90% |
|------------|------------|--------|------------|



6. Do you like gardening? Circle ONE answer:

- a. I do not like                      b. unsure                      c. I like a little                      d. I like a lot

7. Do you like eating fruits and vegetables? Circle ONE answer:

- a. I do not like                      b. unsure                      c. I like a little                      d. I like a lot

8. Do you like cooking? Circle ONE answer:

- a. I do not like                      b. unsure                      c. I like a little                      d. I like a lot

9. Do you like making compost? Circle ONE answer:

- a. I do not like                      b. unsure                      c. I like a little                      d. I like a lot

10. Do you like 'ĀINA Lessons? Circle ONE answer:

- a. I do not like                      b. unsure                      c. I like a little                      d. I like a lot

11. Do you and your family grow any food at home? Circle: Yes or No

If yes, please list the foods you grow at home: \_\_\_\_\_

12. Do you compost at home? (compost pile, worm bins, or bokashi bucket) Circle: Yes or No

13. How often do you eat fruits and vegetables? Circle ONE answer:

- a. I don't eat fruits and vegetables      b. 1-2 times a week      c. 3-5 times a week      d. Every day

14. Circle the fruits and vegetables that you like to eat:

Apple    Cantaloupe    Banana/Mai'a    Blueberries    Avocado    Coconut/Niu    Guava    Dragonfruit  
Mango    Passionfruit/Liliko'i    Honeydew    Rambutan    Tangerine    Strawberry    Blackberries  
Lemon    Starfruit    Breadfruit/'Ulu    Lychee    Orange    Papaya    Pineapple    Watermelon  
Radish    Spinach    Basil    Beans    Broccoli    Squash    Zucchini    Sweet Potato/'Uala    Corn    Tomato  
Lettuce    Watercress    Taro/Kalo    Cucumber    Green Beans    Asparagus    Carrots    Celery    Kale

Other: \_\_\_\_\_

15. Describe what 'āina means to you: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

16. List two ways that you take care of the 'āina:

1. \_\_\_\_\_  
2. \_\_\_\_\_

17. Complete the following sentence:

My favorite thing about 'ĀINA In Schools Lessons is \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## Dear Parent or Caregiver:

This semester, 5th graders will be participating in four garden lessons being delivered by volunteers of 'ĀINA In Schools, a program of Kōkua Hawai'i Foundation. 'ĀINA In Schools is a farm to school initiative that connects children to their local land, waters, and food to grow a healthier Hawai'i. Program components vary from school to school and include nutrition education, garden-based learning, farm field trips, chef visits, waste reduction, and family and community outreach.

Although the lessons are delivered once a month, the students will be engaged in between lessons with regular garden activities that include watering, weeding, making observations, and spending time in the garden.

Photos and Media Releases: By now each of you should have received a Kōkua Hawai'i Foundation Media Release Form. We hope that you have completed this form and have submitted it to your child's classroom teacher. From time to time, KHF takes photos/videos of our lessons to highlight activities that are noteworthy.

To keep yourself up to date on what your child is experiencing in 'ĀINA, we suggest putting this letter up on your refrigerator or bulletin board and talking with your child as the lessons are delivered. You can help reinforce, engage, and learn along with your child by discussing the the lessons and activities after each lesson. A lesson summary and suggested questions/activities for each lesson are listed below.

## Mahalo!

In the **Three Sisters Garden** unit, students will plant a Three Sisters Garden, which is a traditional Native American vegetable garden of corn, beans, and squash. They will also plant culinary and medicinal herbs including mint, rosemary, dill, and basil. They will harvest their garden herbs and vegetables to make fresh butter and cook a Three Sisters Stew. Key concepts for the unit include 'āina, food miles, food security, companion plants, biodiversity, agriculture, crop varieties, seed selection, seed saving, dependence and self-sufficiency, food processing, community, mindfulness, proper harvesting and food handling, and gardening and culinary arts.



## Lesson 1 - Living Plants, Living People

In this lesson, students discuss the arrival of the first European settlers who migrated to North America and learn about the traditional Native American Three Sisters Garden of corn, beans, and squash. They will discuss the concept of food security and the benefits of growing and consuming local produce. Using traditional-style tools, they will plant their garden, starting with the corn, and discuss the culinary and medicinal uses of several different kinds of herbs.

### Questions to discuss with your child:

- What are the three sisters and how do they work together as companion plants?
- What are food miles and how does this relate to food security?



### Suggested home activity:

- On your next grocery shopping trip, identify which foods are locally grown/made and imported.
- Compare and discuss the impact of imported vs. locally grown foods.

## Lesson 2 - Biodiversity

In this lesson, students discuss the concept of biodiversity and how it relates to agriculture, exploring how gardeners and farmers have developed numerous varieties of corn, bean, and squash crops through seed selection and seed saving. They will care for their gardens and herbs and plant bean and squash seeds.

### Questions to discuss with your child:

- What is biodiversity?
- What role does agriculture play in protecting the biodiversity of nature?

### Suggested home activity:

- Observe and discover the different types of plants, animals, and insects in your garden or community.
- Discuss whether the same plants and animals will survive in a place where there's snow.



## Lesson 3 - Self-Sufficiency

In this lesson, students discuss the concepts of dependence and self sufficiency and explore the ways Colonial and other traditional/self-sufficient people obtained and processed their food. Students will get hands-on experience in traditional food processing skills by making and sampling butter with fresh garden herbs. They will care for their garden by removing weeds and adding compost and vermicast.



### Questions to discuss with your child:

- Describe several ways in which we are dependent on others.
- How did you practice self-sufficiency today?

### Suggested home activity:

- Start a small garden and plant items that your family regularly use. For tips and info, visit: <https://www.ctahr.hawaii.edu/site/Info.aspx>

## Lesson 4 - Community

In this lesson, students will discuss the importance of working as a community, then put theory to practice as they harvest, wash, chop, and cook their vegetables and herbs, creating a delicious and nutritious Three Sisters Stew for all to share and enjoy at the Harvest Party. They will remove the remaining garden plant parts, chop them and place them as mulch over the soil, putting the garden bed to rest for the summer.

### Questions to discuss with your child:

- How did you practice working as a community?
- How did you practice being mindful?
- Share something you have learned in The Three Sisters Garden.

### Suggested home activity:

- Make and prepare Three Sisters Stew. Your child will be taking home the instructions and recipe.



If you have any questions or are interested in becoming an 'ĀINA In Schools docent, please do not hesitate to ask.

To learn more about 'ĀINA In Schools at your child's school, please contact your school's 'ĀINA Team Coordinator, or contact:



'ĀINA In Schools  
Program



[aina@kokuahawaiifoundation.org](mailto:aina@kokuahawaiifoundation.org)



# THE THREE SISTERS GARDEN

## Lesson 1 \* Living Plants, Living People

### DESCRIPTION

Students will discuss the arrival of the first European settlers who migrated to North America and learn about the traditional Native American Three Sisters Garden of corn, beans, and squash. They will discuss the concept of food security and the benefits of growing and consuming local produce. Using traditional-style tools they will plant their garden, starting with the corn, and discuss the culinary and medicinal uses of several different kinds of herbs.

**TIME:** 45 minutes

**SUBJECTS:** Health, Language Arts, Science, Social Studies

### LEARNING OBJECTIVES

After this lesson students will be able to:

- Compare life today to life in Colonial America, especially with regard to food security.
- Describe and explain the traditional Native American Three Sisters Garden and the concept of companion plants.
- Describe the culinary uses and medicinal health benefits of several types of herbs.

### ACADEMIC STANDARDS\*

**CCSS, Language Arts:** 5.W.3, 5.W.10, 5.SL.1  
**HCPS III:** HE.3-5.1.3, HE.3-5.1.8, SS.5.2.1, SS.5.2.2, SS.5.3.1, SS.5.3.2, SS.5.3.3, SS.5.6.1, SS.5.8.1  
**NGSS:** 5-LS2-1, Obtaining, Evaluating, and Communicating Information, Developing and Using Models, Patterns, Systems and System Models  
**Lesson Extensions:** 5.W.3, 5.W.7, 5.SL.1, 5.SL.4

\*A detailed list of the Academic Standards can be found in the Unit Overview document.

### LESSON OUTLINE

- I. Introduction (15 minutes)
  1. The Three Sisters
  2. Early America
  3. Tools and Fertilizers
  4. Food Security
  5. Group Activities Overview
- II. Group Activities (25 minutes)
  1. Planting (12 minutes)
  2. Medicinal Herbs (12 minutes)
- III. Closing (5 minutes)



### KEY TERMS AND CONCEPTS

**‘Āina** - Land; that which feeds, nourishes, and sustains us (e.g., food, water, air)

**Antioxidant** (see Culinary and Medicinal Herb Cards) - An enzyme or other organic substance that can counteract damage in animal tissues; for example, eating foods with antioxidants helps to prevent heart disease, cancer, diabetes, macular degeneration (loss of clear vision), and aging (e.g., wrinkles)

**Companion Plants** - Plants that are grown together and enhance each other's growth or protect each other from pests

**Food Miles** - The distance food travels from where it is grown to where it is finally eaten

**Food Security** - The availability of food and one's access to it

**Herbs** - Plants whose leaves, seeds, and/or flowers are used for flavoring, food, medicine, or fragrance

**Migration** - The movement of persons from one country or locality to another

**Trellis** - A structure used as a support for growing plants (especially vines)

## LESSON MATERIALS

### Community Supplies:

- Tape measure
- Stapler and extra staples
- Scissors
- Permanent markers
- 10 to 15 clamshells
- Vermicast (about 1 cup per class)

### Lesson Supplies:

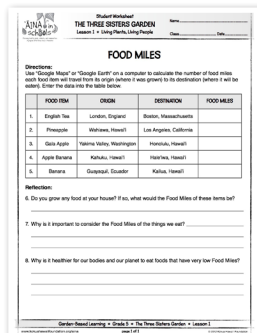
- Culinary and Medicinal Herb Cards (4): Mint, rosemary, dill, basil
- Garden Agreements Sign
- 2 small balls of green yarn (as an acting prop to represent bean plants)
- Live herbs: Mint, rosemary, dill, basil (1 of each per school unless already present in the school gardens)
- Corn seeds (48 per 4'x8' corn bed plus extras, see Group Activities: Planting for details)
- Water key with lanyard
- Student Workbook

### Teaching Team To Provide:

- Milk carton panels (2 panels per school)
- Chopsticks (4 per school)

### School To Provide:

- Garden Journals (if not using Student Workbooks)
- Tape (duct tape or packing tape for sign making)
- 5-gallon bucket and 5+ plastic cups for daily watering (and/or small watering cans)
- Optional: Cover cloth (sheet, burlap, or other) to cover newly planted seeds



FOOD ITEM	ORIGIN	DESTINATION	FOOD MILES
1. English Tea	London, England	Boston, Massachusetts	
2. Pineapple	Honolulu, Hawaii	Los Angeles, California	
3. Green Apples	Honolulu, Hawaii	Honolulu, Hawaii	
4. Apple Bananas	Honolulu, Hawaii	Honolulu, Hawaii	
5. Bananas	Guatemala, Ecuador	Honolulu, Hawaii	

**Reflections:**

6. Do you grow any food at your house? If yes, what would the Food Miles of those items be?

7. Why is it important to consider the Food Miles of the things we eat?

8. Why is it healthier for our bodies and our planet to eat foods that have very low Food Miles?

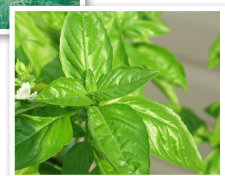
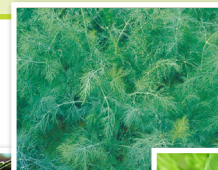
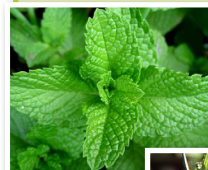
Student Worksheet:  
Food Miles

## ACCOMPANYING DOCUMENTS

- 'ĀINA Pre-Unit Survey
- Take Home Letter
- Guided Notes
- Student Worksheet: Food Miles

## ADVANCE PREPARATION

- Discuss lesson preparation and presentation plans with your teaching team.
- Confirm teachers have administered 'ĀINA Pre-Unit Surveys prior to the first lesson.
- Make copies of the Guided Notes, Student Worksheet and Take Home Letter, one per student if not using the Student Workbook.
- Decide which garden bed(s) will be for corn (Lesson 1 planting) and which for squash (Lesson 2 planting). Corn and squash beds should be equal in number; if there are an odd number of beds, plant two beds of corn for every one of squash.
- Get to know the garden! Allow students to explore their garden soil by having them dig with hands and tools and make careful observations. How does the soil feel and smell? What creatures live in our garden? In preparation for planting, loosen the soil and remove any weeds. Water the soil thoroughly one day before the lesson.
- Have students ready to take notes in their Student Workbooks or Garden Journals.



Culinary and Medicinal Herb Cards



## INTRODUCTION

15 MINUTES

“Aloha! We are... (state docents’ names) with the ‘ĀINA In Schools program. The ‘ĀINA In Schools program connects us to our food and land so we can live healthy lives and be great stewards of the environment. ‘ĀINA is an important Hawaiian word that means land and that which feeds, nourishes, and sustains us all, including food, water, and air.”

“When we come to visit you we will learn to take care of the ‘āina and to grow our own food.”

Get to know which ‘ĀINA components are being implemented at your school so you can briefly refer to them in this section.

For example, “Some other classes are exploring nutrition and food choices, some are

reducing waste through composting, and some are visiting local farms to learn about where our food comes from.”



“This semester we will plant a Native American vegetable garden called the Three Sisters Garden.” During the discussion, write key terms on the board and have students take notes on the Guided Notes in their Student Workbooks or journals.

## THE THREE SISTERS

“The three sisters are corn, beans and squash.” Ask for two volunteers to represent each type of crop. “In the garden these plants work together! They are **COMPANION PLANTS** that help each other grow.” Give the green yarn to the bean volunteers and have all volunteers act out the following sequence:

1. “First we plant the corn.” Corn volunteers begin as seeds and grow up straight and tall.
2. “Then we plant the beans next to the corn. The bean plants climb up the corn, using the corn as

a TRELLIS, which is a structure that supports growing plants.” Bean volunteers start from the soil and wrap the yarn around the corn plants.

3. “Bean plants give nitrogen to the soil when their roots or leaves decompose, providing food for the hungry corn plants.” Bean plants feed corn plants.
4. “Squash plants cover the ground, shading it from the hot sun, conserving water and discouraging weeds. Their pokey leaves also may help to discourage wild animals from feeding on the corn and beans.” Squash volunteers squat or lie on the ground, covering the soil.



Volunteers may be seated. Ask students to share how the three sisters help each other. Draw a simple diagram of the three sisters on the board, and have students do the same in their Student Workbooks or journals



“In the garden today we will plant corn because it takes the longest to grow. In our next lesson we will plant the beans and squash.” Note: If the Three Sisters Garden is being planted in small raised garden beds (e.g., 4’x8’), the corn and beans should be planted in one garden bed and the squash in another so that they will each have enough room to grow and thrive.



## INTRODUCTION

## CONTINUED

### EARLY AMERICAN LIFE

"The concept of the Three Sisters Garden is hundreds of years old! This is a traditional garden grown by many Native American peoples. By observing and learning from the natural world for many generations, the Native Americans developed this successful way to farm."

"Who came to the Americas in the 1600s (400 years ago)?" Desired answer: People from Europe who wanted a new life.

"Imagine you were a pilgrim. What would you have brought with you if you left your home for a new land and did not know what you might find when you got there? What things are most important to meet your basic needs during and after MIGRATION?"

Desired answers:

- Food: Plants, seeds, animals (e.g., pigs, chickens)
- Tools: Planting and building
- Weapons: Fighting and hunting
- Medicine: Prevent and treat illness



Medicinal plants in the garden:  
Aloe, comfrey, oregano.

"Did the settlers have a Safeway or a Home Depot to go to to buy their necessities?" Desired answer: No!

"Where did their food come from?" Desired answer: Vegetable gardens, wild plants, livestock, hunting and fishing.

"What would happen if you didn't know how to grow food or to hunt? You could starve. In fact, the settlers almost died their first winter from lack of food. If the Native Americans had not shared food and taught them the planting methods they used, it is uncertain whether the settlers would have survived their first year. As we plant our garden today, realize that you are practicing an important survival skill. Plant your seeds carefully and be sure to take good care of your garden by watering, observing, and visiting it often."

"Did the European settlers and Native Americans have hospitals?" Desired answer: No!

"Most medicines and healing cures came from plants. Today we will also discuss several different kinds of HERBS, which are plants used for flavoring, food, medicine, or fragrance, and how they can be used to heal us."

### TOOLS AND FERTILIZERS

"Our tools and fertilizers can come directly from nature also. We will use clamshells for digging and vermicast (from composting worms) to provide nutrition for our young plants." Show clamshells and vermicast to students.



## INTRODUCTION

## CONTINUED

### FOOD SECURITY

"Today in Hawai'i, about 80 to 90% of the food we eat is imported from thousands of miles away! What are some of the benefits of growing more of our own food here in Hawai'i?"

- Our food is fresher and also healthier since it is full of life and close to the source.
- We can grow food without using synthetic chemicals (pesticides, fertilizers, etc.).
- We will protect the planet and our climate by reducing our FOOD MILES (the distance food travels from farm to table), reducing pollution from airplanes, boats, and trucks, and saving energy.
- We will have greater FOOD SECURITY (availability and access to food) on a daily basis and in the event of an emergency.



### GROUP ACTIVITIES OVERVIEW

"In the garden today, one group will plant corn seeds and make signs and the other will discuss and plant medicinal herbs, then we will switch."

#### Garden Agreements

Have students take a deep breath, then repeat and discuss the Garden Agreements as listed on the Garden Agreements Sign. Spend some time during this first lesson to review with students the examples on page 2 of the sign.

- I will be SAFE
- I will be KIND
- I will have an OPEN MIND
- I will use my TIME WELL



Divide the students into two groups before going outside.



## GROUP ACTIVITIES

**25 MINUTES**

Gather in a circle around the garden. Share gratitude for the garden, our seeds, the sun, air, water, soil, and each other. Optional: Sing a garden/planting song. Note: Developing a routine protocol for entering the garden helps to cultivate a sense of respect and appreciation for this special place.

Direct students to their assigned group area. Rotate groups after 12 minutes. Regroup for closing.

### PLANTING (12 minutes)

Students will use clamshells to prepare the soil and plant The Three Sisters Garden from seed, starting with the corn. Squash and beans will be planted during Lesson 2 due to shorter time to maturity than corn.

Have students use the tape measure to create the rows and spacing between seeds when planting.

Have a group of students create signs and label the beds: "Corn and Beans" and "Squash" according to the number of beds for each, as described on page 6.



## GROUP ACTIVITIES

## CONTINUED

**Planting Directions for the Corn Garden Bed(s)**  
(see planting diagram at right):

**EVEN NUMBER OF 5TH GRADE CLASSES:**

- One corn bed to one squash bed.
- Each class plants one and a half rows of corn in the corn bed during Lesson 1.
- Each group (class is divided in two) plants 3/4 row.
- Water the soil in the squash bed and leave it covered.

**ODD NUMBER OF 5TH GRADE CLASSES:**

- Two corn beds to one squash bed.
- Each class plants two rows of corn during Lesson 1 (total of 6 rows in two beds).
- Each group (class is divided in two) plants 1 row.
- Water the soil in the squash bed and leave it covered.

**First Group:**

1. Loosen the soil using clamshells, sticks, and hands.
2. Use the tape measure to create three long rows, 1 foot apart.
3. Sprinkle vermicast into the planting row. Plant corn seeds 1 inch deep, 6 inches apart. Water thoroughly.

**Second Group:**

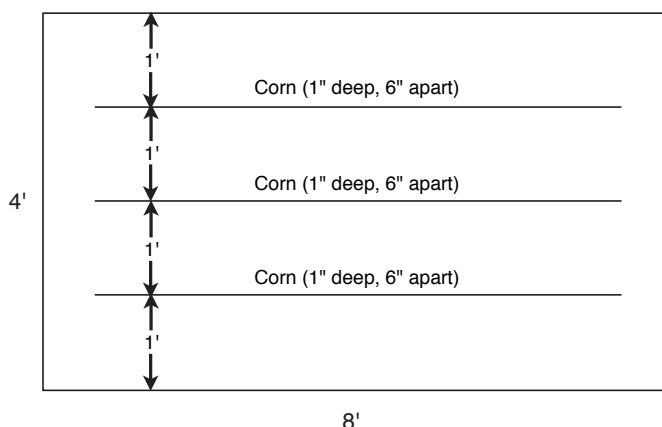
1. Sprinkle vermicast into the planting row. Plant corn seeds 1 inch deep, 6 inches apart. Water thoroughly.

Optional: Place a cover cloth over the planted seeds.



The basil group shares medicinal about their herb.

Planting Diagram



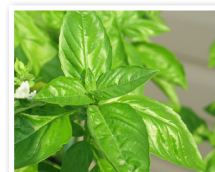
**MEDICINAL HERBS (12 minutes)**

Use the live samples (or existing garden plantings) of each herb for this activity. If they are not already planted in the garden, the potted herbs will be planted for use as medicines and in cooking.

Herbs are plants whose many parts are used for flavoring, food, medicine, or fragrance. Ask the students if they have used herbal medicine before or know of anyone who has? Explain that people have used plants for thousands of years to heal themselves and to improve the taste of food.

Divide the group into 4 smaller groups and hand out the Culinary and Medicinal Herb Cards, one per group. Have each group read their card together, then find the herb in the garden and collect a sample to observe and share, or use their potted plant. Then have the groups come together to share with each other about the healing benefits of each herb (see Cards for further details):

- Basil - Made into a tea to aid digestion
- Mint - Helps relieve nausea and facilitate digestion
- Dill - Helps soothe an aching stomach
- Rosemary - Treats headaches



Culinary and Medicinal Herb Card: Basil



## GROUP ACTIVITIES

## CONTINUED

Pass each plant around and have the students experience the plant by smelling the leaves and noticing what it looks like.

“Traditional knowledge about plants has been gathered for thousands of years. Most of our medicines still come from plants. In fact, our food can be medicine! Botanists and other scientists continue to look to nature for ways to heal our ailments.”

Each class may transplant one or more plants if necessary. Use a garden space separate from the vegetable beds for the herb garden. Guide students to properly transplant their herbs into the garden:

1. Dig a hole before removing the plant from its pot.
2. Measure for proper depth; the soil level inside the pot should match the garden soil level.
3. Mix a small handful of vermicast into the soil at the bottom of the planting hole.

4. Remove the plant by gently squeezing the pot and turning it upside down, supporting the plant and soil with your other hand. Do not pull the plant out of the pot as this can damage roots.
5. Gently loosen the soil and root ball. Place the plant in the hole; be sure it is upright.
6. Fill in and gently firm the soil around the roots; do not compact.
7. Water gently and thoroughly.



## CLOSING

## 5 MINUTES

Gather all the students in the garden. Ask them to share about their experience.

Discuss with students:

- What are the three sisters and how do they work together as COMPANION PLANTS?
- What are FOOD MILES and how does this relate to FOOD SECURITY?
- Name some of the health benefits of the HERBS we studied today.

“Please take good care of your garden and make sure to water and visit it every day so that the soil stays moist and the seeds will sprout and grow. Gardens need lots of love and care! If we take care of our plants, they will take good care of us. Garden Monitors will be assigned to visit the gardens daily to water and complete a Garden Journal entry.”

Show students how to feel the soil with their fingers to test if it has enough moisture. Soil should be moist but not overly wet.

“In our next lesson we will plant the beans and squash. Please also water the soil in the squash bed so that it stays alive and ready for our seeds. Be sure to remove the cover cloth (if cover cloth is being used) as soon as the sprouts emerge.”

**All students must wash their hands thoroughly with soap and water after working in the garden.** Demonstrate the proper hand washing method: Wet, lather, and scrub hands and wrists with soap for 15 seconds, then rinse thoroughly. Be conscious of keeping hands clean after washing. Explain that washing our hands keeps us healthy!

## FOLLOW UP GARDEN CARE

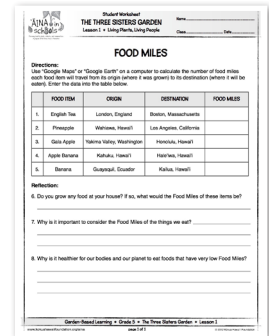
Follow Up Garden Care is the responsibility of the classroom teacher and students.

- Assign one or more **Garden Monitors** to water the garden, check for sprouts, and complete the class' Garden Journal entry every day (including observations about the gardens and plants).
- The squash bed (which does not yet have seeds in it) should also be watered to keep the soil alive.
- If the soil is covered with a cover cloth, remove it as soon as the first sprouts appear (within about 4 to 10 days). Hang to dry and store for future use.
- Remove weeds from in and around the garden bed.
- As the corn plants grow, mound soil around the base of the stem to help them stand upright.
- Students must wash their hands thoroughly with soap and water after working in the garden.

## FOLLOW UP ACTIVITIES

Follow Up Activities are the responsibility of the classroom teacher.

- Have students complete the Food Miles Student Worksheet.
- Have students make daily or weekly garden observations and journal entries including notes, drawings, poems, stories, etc.



Student Worksheet: THE THREE SISTERS GARDEN Lesson 1 \* Living Plants, Living People

### FOOD MILES

**Directions:** Use "Google Maps" or "Google Earth" on a computer to calculate the number of food miles each food item has traveled from its origin (where it was grown) to its destination (where it will be eaten). Enter the data into the table below.

FOOD ITEM	ORIGIN	DESTINATION	FOOD MILES
1. English Tea	London, England	Boston, Massachusetts	
2. Pineapple	Honolulu, Hawaii	Los Angeles, California	
3. Gala Apples	Malina Valley, Washington	Honolulu, Hawaii	
4. Apple Sauce	Honolulu, Hawaii	Honolulu, Hawaii	
5. Banana	Guatemala, Guatemala	Honolulu, Hawaii	

**Reflections:**

6. Do you grow any food at your house? If so, what would the Food Miles of these items be?

7. Why is it important to consider the Food Miles of the things we eat?

8. Why is it healthier for our bodies and our planet to eat foods that have very low Food Miles?

Order: Reading \* Drawing \* Writing \* The Three Sisters Garden \* Lesson 1



Student Worksheet:  
Food Miles

## LESSON EXTENSIONS

### Food Is Medicine

(5.W.7, 5.SL.4)

- Have students do research on and present to the class about one or more herbs or other medicinal and culinary plants of their choice to further explore the healing properties of plants.
- Be sure to discuss examples of plants that are often used medicinally in Hawai'i, including:
  - Aloe for sunburn
  - Ginger to boost immunity and treat headaches and nausea
  - Green tea to fight cancer and heart disease
  - 'Olena (tumeric) to prevent and fight cancer



### Farm Field Trip

(5.W.3, 5.SL.1)

- Visit a local farm with students and talk with the farmer(s) about what their life is like.
- Have students take notes during the visit and write a follow up reflection about the experience.
- Discuss together your visions for a healthier, more sustainable Hawai'i.

### Food Miles Matter

(5.W.7, 5.SL.1)

- Have students visit a grocery store and select three different kinds of fruits and vegetables grown in different locations.
- Have students use "Google Maps" on a computer to calculate the Food Miles, or number of miles each food item has traveled in order to reach their home.
- Compare and discuss the significant impact of imported vs. locally grown foods.



## KEY TERMS AND CONCEPTS

**‘Āina** - Land; that which feeds, nourishes, and sustains us (e.g., food, water, air)

**Antioxidant** - An enzyme or other organic substance that can counteract damage in animal tissues; for example eating foods with antioxidants help to prevent diseases, cancer, diabetes, etc.

**Companion Plants** - Plants that are grown together and enhance each other's growth or protect each other from pests

**Food Miles** - The distance food travels from where it is grown to where it is finally eaten

**Food Security** - The availability of food and one's access to it

**Herbs** - Plants whose leaves, seeds, and/or flowers are used for flavoring, food, medicine, or fragrance

**Migration** - The movement of persons from one country or locality to another

**Trellis** - A structure used as a support for growing plants (especially vines)

Directions: Use this space to record your notes, drawings, and observations.



## FOOD MILES

**Directions:**

Use “Google Maps” or “Google Earth” on a computer to calculate the number of food miles each food item will travel from its origin (where it was grown) to its destination (where it will be eaten). Enter the data into the table below.

	FOOD ITEM	ORIGIN	DESTINATION	FOOD MILES
1.	English Tea	London, England	Boston, Massachusetts	
2.	Pineapple	Wahiawa, Hawai'i	Los Angeles, California	
3.	Gala Apple	Yakima Valley, Washington	Honolulu, Hawai'i	
4.	Apple Banana	Kahuku, Hawai'i	Hale'iwa, Hawai'i	
5.	Banana	Guayaquil, Ecuador	Kailua, Hawai'i	

**Reflection:**

6. Do you grow any food at your house? If so, what would the Food Miles of these items be?

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7. Why is it important to consider the Food Miles of the things we eat? \_\_\_\_\_

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8. Why is it healthier for our bodies and our planet to eat foods that have very low Food Miles?

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## DESCRIPTION

Students will discuss the concept of biodiversity and how it relates to agriculture, exploring how gardeners and farmers have developed numerous varieties of corn, beans, and squash crops through seed selection and seed saving. They will care for their gardens and herbs and plant bean and squash seeds.

**TIME:** 45 minutes

**SUBJECTS:** Language Arts, Science, Social Studies

## LEARNING OBJECTIVES

After this lesson students will be able to:

- Understand and discuss the concept and importance of biodiversity.
- Understand that different varieties of crops exist thanks to seed selection and seed saving.
- Explain why and how to cultivate biodiversity in our gardens.

### ACADEMIC STANDARDS\*

**CCSS, Language Arts:** 5.W.3, 5.W.10, 5.SL.1  
**HCPS III:** SS.5.2.1, SS.5.6.1 **NGSS:** 5-LS2-1,  
Obtaining, Evaluating, and Communicating  
Information, Analyzing and Interpreting Data,  
Developing and Using Models, Patterns, Systems  
and System Models **Lesson Extensions:** 5.W.1,  
5.W.2, 5.W.7, 5.SL.1, 5.SL.4, 5.SL.5

\*A detailed list of the Academic Standards can be found in the Unit Overview document.

## LESSON OUTLINE

- I. Introduction (15 minutes)
  1. Biodiversity and Crop Varieties
  2. Seed Selection and Saving
  3. The Importance of Biodiversity in Agriculture
  4. Group Activities Overview
- II. Group Activities (25 minutes)
  1. Garden Care
  2. Herb Care
  3. Squash Planting
  4. Pole Bean Planting
- III. Closing (5 minutes)



### KEY TERMS AND CONCEPTS

**Agriculture** - The science, art, and occupation of growing crops and raising animals for food and other products

**Beneficial** - Good, helpful

**Biodiversity** - Biological diversity; the diversity (variability) of life within species, between species, and of ecosystems

**Crop** - A plant that people grow for food, especially fruits, vegetables, and grains

**Crop Varieties** - Cultivated forms of one species of plant each bearing certain characteristics

**Diversity** - Variety; variability; of various kinds

**Seed Selection** - The process of selecting, saving, and planting good quality seeds from plants with the most desirable characteristics in order to grow a strong and healthy successive crop that possesses the desired features (e.g., abundance of food, disease resistance, etc.)

**Seed Saving** - The practice of harvesting, drying, and saving seeds for future planting



## LESSON MATERIALS

### Community Supplies:

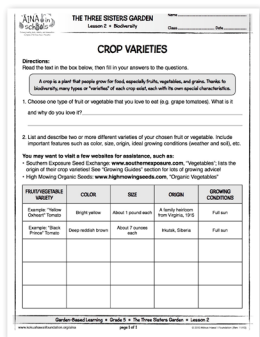
- Tape measure
- Vermicast (about 1 cup per class)

### Lesson Supplies:

- Crop Varieties Signs (3): Corn, beans, squash
- Garden Agreements Sign
- Pole bean seeds (24 seeds per 4'x8' corn bed plus extras)
- Zucchini squash seeds (28 seeds per 4'x8' squash bed plus extras, see Group Activities: Garden Care and Planting for details)
- Extra corn seeds
- Student Workbook

### School To Provide:

- Garden Journals (if not using Student Workbooks)
- Bucket and cups for watering
- Optional: Compost (about 1/2 bucket per class)
- Optional: Cover cloth (sheet, burlap, or other) to cover newly planted seeds



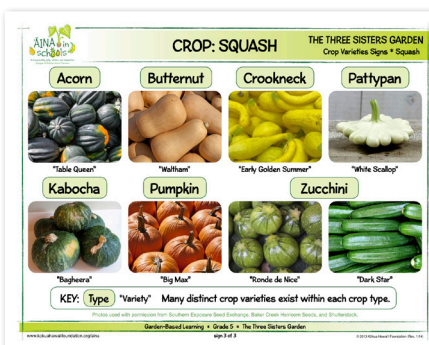
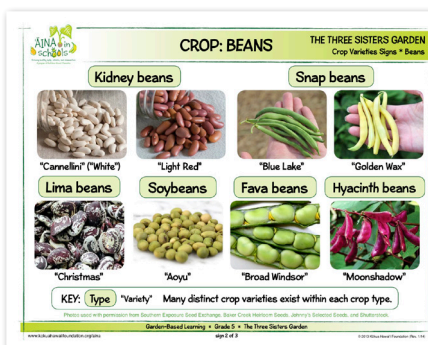
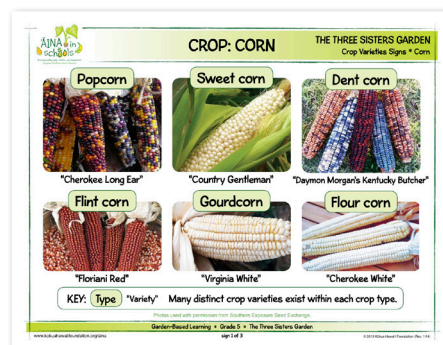
Student Worksheet:  
Crop Varieties

## ACCOMPANYING DOCUMENTS

- Guided Notes
- Student Worksheet: Crop Varieties

## ADVANCE PREPARATION

- Discuss lesson preparation and presentation plans with your teaching team.
- Make copies of the Student Worksheet, one per student if not using the Student Workbook.
- Optional: Harvest compost from the school's compost piles.
- Have students ready to take notes in their Student Workbooks or Garden Journals



Crop Varieties Signs

## INTRODUCTION

15 MINUTES

Invite students to share some observations they have made in the garden. During the discussion, write key terms on the board and have students take notes in their Student Workbooks or journals.

### BIODIVERSITY AND CROP VARIETIES

“What does diversity mean?” Accept a few student answers. “DIVERSITY means variety. What does biodiversity mean?” Accept a few student answers. “BIODIVERSITY is the diversity of life.”

“Raise your hand if you have a brother or sister. Do they look and act *exactly* like you do?” Desired answer: No! “Although you have the same parents, you are different. In fact, there is no one in the whole world who is just like you! This is one example of biodiversity, the diversity that exists in nature.”

“Traditionally, CROPS, or plants that people grow for food, are also very diverse, with thousands of different CROP VARIETIES planted and grown, each bearing its own unique set of characteristics.” Show the Crop Varieties Signs to demonstrate a sampling of the different types (e.g., zucchini) and varieties (e.g., “Dark Star”) of corn, beans, and squash.

#### Crop Varieties Signs



### SEED SELECTION AND SAVING

Point to one of the ears of corn on the Corn Crop Varieties Sign. “If you were to take any one of these corn ears and plant each one of its seeds, would each resulting plant be the same or different?” Desired answer: They would be different.

“What might some of the differences be?” Accept a few student answers.

“Some plants would be taller, some shorter, some with more seeds, some with fewer seeds. Some may survive better against drought, diseases, and pests.” Draw simple examples on the board.

“By carefully observing our crops, we can select seeds from the plants that demonstrate the most desirable characteristics, such as the greatest amount of food and a natural resistance to pests, for example. This process is called SEED SELECTION, and we can use the seeds selected from our chosen plants to grow successive crops of food.”

“Through many generations of seed selection, gardeners and farmers develop new crop varieties containing a diversity of desirable characteristics.”

“In order to preserve each crop variety gardeners and farmers practice SEED SAVING by harvesting, drying, and properly storing seeds so that they can be shared and planted again.”

“Through seed selection and seed saving, gardeners and farmers work with and protect the biodiversity of nature in order to produce an abundance of delicious and nutritious food.”



Gardeners and farmers save corn seeds for replanting by allowing corn ears to mature on the stalks, then harvesting and shucking the ears (removing the husks) and allowing kernels to thoroughly dry on the cobs, after which they are rubbed off by hand.



## INTRODUCTION

## CONTINUED

## THE IMPORTANCE OF BIODIVERSITY IN AGRICULTURE

Invite students to share their understanding of the term agriculture. "AGRICULTURE is both a science and an art, involving growing crops and raising animals for food and other products. Agriculture plays an essential role in nearly all cultures! It takes place on small and large scales all over the world."

"Why is it important to cultivate biodiversity in our gardens and farms and how can this be achieved?"

**Plants help each other:** "We can plant a variety of different types of plants together that will help each other grow, like the three sisters (corn, beans, and squash). These are companion plants." Review how these plants work together.

**Plants attract beneficial**

**creatures:** "Every different kind of plant attracts one or more different kinds of BENEFICIAL, or helpful insects and soil organisms! For example, when we grow dill in the garden, it can attract ladybugs, which eat pests (aphids) in the garden."

**Diversity equals food security:**

"If one type of plant does not grow well due to climate or pests, at least we have the others to feed us!"



Adult ladybugs and their larvae eat aphid pests.

## GROUP ACTIVITIES OVERVIEW

"In the garden today, we will observe examples of biodiversity. Groups will care for the gardens and herbs and plant bean and squash seeds."

**Garden Agreements**

Have students take a deep breath, then review the Garden Agreements:

- I will be SAFE
- I will be KIND
- I will have an OPEN MIND
- I will use my TIME WELL



Divide the students into four groups before going outside.



The healthiest gardens are the most diverse.

## GROUP ACTIVITIES

**25 MINUTES**

Students will spend the entire time with their group.  
Regroup for closing.

### GARDEN CARE

1. Notice the variety of sizes and characteristics among the corn plants; this is the result of biodiversity. “Which plants would you select and save seeds from for the next generation?”
2. Remove weeds from in and around the gardens.
3. Plant additional corn seeds in any bare patches.
4. Add about 1 cup of vermicast to the garden. If the vermicast is moist, dissolve it in water and water the soil with the nutrient-rich water. If the vermicast is dry, sprinkle it over the soil and mix it in lightly.
5. Optional: Add a handful of compost to the base of each corn plant.
6. Mound soil around the base of each corn plant so they stand straight with no roots exposed.



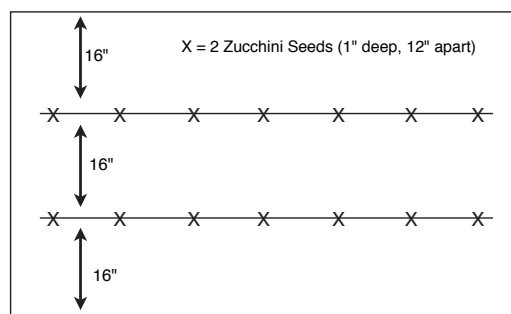
### HERB CARE

1. Visit the herbs that were studied (and planted, if applicable) in Lesson 1 (mint, rosemary, dill, basil).
2. Notice the variety of different characteristics among the herb plants; this is the result of biodiversity.
3. Water, weed, and fertilize the herbs with vermicast and compost (optional).

### SQUASH PLANTING (See diagram at right)

1. Loosen the soil in the squash bed using clamshells, sticks, and hands.
2. Have students use the tape measure to create two long rows, 16 inches apart.
3. When ready, hand the seeds to students and have them observe the variety of sizes/shapes, etc. among the seeds; this is the result of biodiversity.
4. Plant 2 squash seeds together, 1 inch deep, 12 inches apart. Water thoroughly.
5. Optional: Place a cover cloth over the planted seeds.

Planting Diagram



### POLE BEAN PLANTING

1. Hand the seeds to students and have them observe the variety of sizes/shapes, etc. among the seeds; this is the result of biodiversity.
2. Plant the pole bean seeds among the corn rows (e.g., at the base of every other corn plant, about 2 inches away from the stalk), 1 inch deep.
3. If other classes are sharing the same corn bed, leave room for successive classes to plant.





## CLOSING

5 MINUTES

Gather all the students in the garden. Ask them to share about their experience.

Discuss with students:

- What is BIODIVERSITY?
- What role does AGRICULTURE play in working with and protecting the BIODIVERSITY of nature?
- Describe the process of SEED SELECTION and SEED SAVING.
- How do these processes relate to the creation and preservation of CROP VARIETIES?



"Please continue to water and visit your gardens every day! In our next lesson we will make food together and share a snack."

**All students must wash their hands thoroughly with soap and water after working in the garden.**



## FOLLOW UP GARDEN CARE

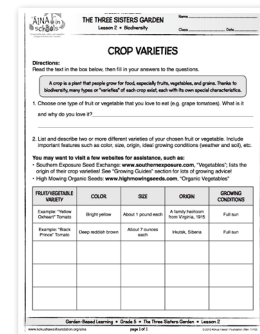
Follow Up Garden Care is the responsibility of the classroom teacher and students.

- Continue to have the Garden Monitors visit the gardens daily to water and complete the class' Garden Journal entry.
- If the soil is covered with a cover cloth, remove it as soon as the first sprouts appear (within about 4 to 10 days). Hang to dry and store for future use.
- Remove weeds from in and around the garden bed.
- As the corn plants grow, mound soil around the base of the stem to help them stand upright.
- Students must wash their hands thoroughly with soap and water after working in the garden.

## FOLLOW UP ACTIVITIES

Follow Up Activities are the responsibility of the classroom teacher.

- Have students complete the Crop Varieties Student Worksheet.
- Have students make daily or weekly garden observations and journal entries including notes, drawings, poems, stories, etc.



**CROP VARIETIES**

Directions: Read the text in the box below. Then fill in your answers to the questions.

A crop is a plant that people grow for food, especially fruits, vegetables, and grains. Thanks to thousands of years of "breeding" of seed crops, we now have many different varieties of crops.

1. Choose one type of fruit or vegetable that you love to eat (e.g., grapes, tomatoes). What is it and why do you love it?

2. List and describe two or more different varieties of your chosen fruit or vegetable. Include important features such as color, size, shape, and growing conditions (weather and soil, etc.).

You may want to visit the website for assistance, such as:

- Southern Exposure Seed Exchange: [www.southernseeds.com](http://www.southernseeds.com) "Vegetables" lists the origin of these crop varieties. See "Growing Crops" section for info on growing advice.
- High Mowing Organic Seeds: [www.highmowingseeds.com](http://www.highmowingseeds.com) "Organic Vegetables"

PLANTABLE NAME	COLOR	SIZE	SHAPE	GROWING CONDITIONS
Example: Yellow Cherry Tomato	Bright yellow	About 1 pound each	A fairly round shape	Full sun
Example: Black Pearl Tomato	Deep reddish brown	About 1 pound each	Round, oblong shape	Full sun

Student Worksheet • Grade 5 • The Three Sisters Garden • Lesson 2

Student Worksheet:  
Crop Varieties



## LESSON EXTENSIONS

### Biodiversity At Our School

(5.W.7, 5.SL.1)

1. Discover the diversity of life that exists on campus. Students should make careful observations and record them in their journals, such as the number of different types of plants, animals and insects they find. Have students draw, describe, count and record the number of types, and the number of individuals per type.
2. Have students compare and discuss their results with a partner or as a group.
3. Ideas for exploration include:
  - Discover biodiversity on a micro level by looking closely at a patch of grass that students may be surprised to see is filled with diversity and life.
  - Notice the many different ornamental and edible plantings around campus.
  - Look for different types of beneficial insects or animals that visit or inhabit the campus.
  - Explore a wild/unmanaged area of the school grounds to see what nature has planted and nurtured.

### Biodiversity of Planet Earth

(5.W.1, 5.W.2, 5.W.7, 5.SL.1)

1. Have students research how many species of plants and animals exist on Earth, as well as the positive and negative human impacts on Earth's biodiversity.
2. Have students write explanatory and opinion pieces on the topic.
3. Discuss their findings, thoughts, and ideas for action as a group.



### Food Origin Game

(5.W.7, 5.SL.1, 5.SL.4, 5.SL.5)

1. Discuss the fact that all cultivated food crops originated as wild plants that were domesticated by humans.
2. Have students work in groups to select a type of fruit or vegetable and research its natural origins, as well as facts about the crop's domestication and migration around the world. Has the crop always looked the way it does now? For example, carrots originated from wild plants in Asia, but the orange color did not naturally exist. This trait was selected for by humans over many generations, made possible by the genetic diversity of the species. Other examples of crops include bananas, taro (kalo), eggplants, cucumbers, apples, etc.
3. Have students create an image card of their crop and place it on its area of origin on a world map in the classroom. Have groups share their findings with the class.
4. Study and discuss how the importation of produce from other parts of the world has had an impact on the biodiversity of Hawai'i (e.g., introduction of invasive species).



### Save Our Seeds

(5.W.2, 5.W.7, 5.SL.1, 5.SL.4)

1. Have students select a food crop that they are interested in growing.
2. Visit <http://howtosaveseed.com/seedsavingdetails.php> to discover the seed saving process for their selected food crop.
3. Have students write a mini report on their findings and share them with the class.
4. Have the class choose one or more crops for which to obtain and plant the seeds in the gardens, allow seeds to develop, then harvest and save the seeds as directed on the website.





## KEY TERMS AND CONCEPTS

**Agriculture** - The science, art, and occupation of growing crops and raising animals for food and other products

**Beneficial** - Good, helpful

**Biodiversity** - Biological diversity; the diversity (variability) of life within species, between species, and of ecosystems

**Crop** - A plant that people grow for food, especially fruits, vegetables, and grains

**Crop Varieties** - Cultivated forms of one species of plant each bearing certain characteristics

**Diversity** - Variety; variability; of various kinds

**Seed Selection** - The process of selecting, saving, and planting good quality seeds from plants with the most desirable characteristics in order to grow a strong and healthy successive crop that possesses the desired features

**Seed Saving** - The practice of harvesting, drying, and saving seeds for future planting

Directions: Use this space to record your notes, drawings, and observations.





Student Worksheet  
**THE THREE SISTERS GARDEN**  
Lesson 2 \* Biodiversity

Name .....

Class ..... Date .....

## CROP VARIETIES

### Directions:

Read the text in the box below, then fill in your answers to the questions.

A crop is a plant that people grow for food, especially fruits, vegetables, and grains. Thanks to biodiversity, many "varieties" of each crop exist, each with its own special characteristics.

1. Choose one type of fruit or vegetable that you love to eat (e.g., grape tomatoes). What is it and why do you love it? \_\_\_\_\_

2. In the table below, list and describe two or more different varieties of your chosen fruit or vegetable. Include important features such as color, size, origin, etc.

### You may want to visit a few websites for assistance, such as:

- Southern Exposure Seed Exchange: [www.southernexposure.com](http://www.southernexposure.com), "Vegetables"; lists the origin of their crop varieties! See "Growing Guides" section for lots of growing advice!
- High Mowing Organic Seeds: [www.highmowingseeds.com](http://www.highmowingseeds.com), "Organic Vegetables"

FRUIT/VEGETABLE VARIETY	COLOR	SIZE	ORIGIN	GROWING CONDITIONS
Example: "Yellow Oxheart" Tomato	Bright yellow	About 1 pound each	A family heirloom from Virginia, 1915	Full sun
Example: "Black Prince" Tomato	Deep reddish brown	About 7 ounces each	Irkutsk, Siberia	Full sun

# THE THREE SISTERS GARDEN

## Lesson 3 \* Self-Sufficiency

### DESCRIPTION

Students will discuss the concepts of dependence and self-sufficiency and explore the ways Colonial and other traditional/self-sufficient people obtained and processed their food. Students will get hands-on experience in traditional food processing skills by making and sampling butter with fresh garden herbs. They will care for their garden by removing weeds and adding compost and vermicast.

**TIME:** 45 minutes

**SUBJECTS:** Language Arts, Science, Social Studies

### LEARNING OBJECTIVES

After this lesson students will be able to:

- Understand the concept and importance of self-sufficiency in food production.
- Discuss how traditional societies obtained and processed their food.
- Demonstrate an example of a traditional food processing skill.

### ACADEMIC STANDARDS\*

**CCSS, Language Arts:** 5.W.3, 5.W.10, 5.SL.1  
**HCPS III:** SS.5.2.1, SS.5.6.1 **NGSS:** 5-LS2-1,  
Developing and Using Models, Patterns, Systems  
and System Models **Lesson Extensions:** 5.W.1,  
5.W.7, 5.SL.1, 5.SL.4, 5.SL.5

\*A detailed list of the Academic Standards can be found in the Unit Overview document.

### LESSON OUTLINE

- I. Introduction (15 minutes)
  1. Self-Sufficiency
  2. Food Processing
  3. Group Activities Overview
- II. Group Activities (20 minutes)
  1. Traditional Food Processing Skills (12 minutes)
  2. Garden Care (12 minutes)
- III. Closing and Snack (10 minutes)



### KEY TERMS AND CONCEPTS

**Dependent** - Relying on someone or something else for aid or support

**Food Processing** - The transformation of raw plant or animal materials, such as grains, produce, meats, and dairy, into other food products

**Self-Sufficient** - Able to supply one's own needs without external assistance

**Traditional** - Information, customs, beliefs, etc. handed down for generations

## LESSON MATERIALS

### Community Supplies:

- 3 clean scissors
- Large bowl (for cutting herbs)
- Salt
- Cooking spoon
- Large platter (for crackers)
- Dishtowel (for cleanup)
- Sponge and soap (to wash items if necessary)
- Vermicast (about 1 cup per class)

### Lesson Supplies:

- Butter Making Instructions Sign
- Garden Agreements Sign
- 2 jars with lids (1 for making butter and one for storing drained buttermilk)
- 2 butter knives
- Student Workbook

### Teaching Team To Provide (with reimbursement for groceries):

- Organic heavy whipping cream at cool or room temperature (1/2 pint per class)
- Whole grain crackers or bread for serving the butter (2 crackers or 1 slice of bread per student)
- Mini-cooler with ice pack for keeping cream cool
- Small container with lid (for extra butter)

### School To Provide:

- Garden Journals (if not using Student Workbooks)
- Bucket and cups for watering and snack waste
- Optional: Compost (about 1/2 bucket per class)
- Optional: Mulch (about 1 bucket per class)



## ACCOMPANYING DOCUMENTS

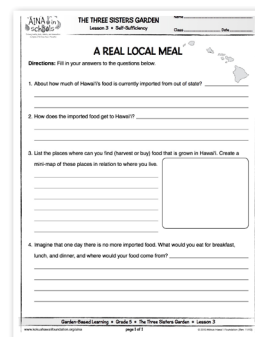
- Guided Notes
- Student Worksheet: A Real Local Meal

## ADVANCE PREPARATION

- Discuss lesson preparation and presentation plans with your teaching team.
- Make copies of the Student Worksheet, one per student if not using the Student Workbook.
- Optional: Harvest compost and mulch from the school's compost and mulch piles.
- Purchase grocery ingredients: Organic heavy whipping cream (1/2 pint per class; keep cool) and whole grain crackers or bread (2 crackers or 1 slice of bread per student; check ingredients and any student allergies to wheat, nuts, etc.).
- Keep the cream cool with a mini cooler and ice pack or keep in refrigerator until ready for use.
- Have students ready to take notes in their Student Workbooks or Garden Journals.



Butter Making  
Instructions Sign



Student Worksheet:  
A Real Local Meal



## INTRODUCTION

15 MINUTES

Invite students to share some observations they have made in the garden. During the discussion, write key terms on the board and have students take notes in their Student Workbooks or journals.

### SELF-SUFFICIENCY

Discuss the meaning of the following key concepts with students:

- **DEPENDENT** - To rely on someone or something else for aid or support
- **SELF-SUFFICIENT** - Able to supply one's own needs without external assistance

Brainstorm with students about some of the things we need and some of the ways in which we are **DEPENDENT** or **SELF-SUFFICIENT** in meeting these needs. Examples may include:

- **Water** - We depend on rain, forests (watersheds), board of water supply, energy for pumping. We can be more self-sufficient by installing rainwater catchment and purification systems on buildings.
- **Transportation** - We depend on cars, trucks, and ships that bring supplies to Hawai'i, and oil companies for fuel. We can be more self-sufficient by walking, biking, carpooling, using public transportation, more often.
- **Food** - We depend on farmers, healthy soil, climate, seed companies, and businesses that process, transport, and sell food. We can be more self-sufficient by growing our own food, saving seeds, and supporting local farmers.

### FOOD PROCESSING

"TRADITIONAL societies like Native and Colonial Americans, whose information, customs, and beliefs have been handed down for generations, were much more self-sufficient than most of us today. They spent time every day growing, harvesting, and processing their own food to eat, while today we largely depend on others to do this for us. **FOOD PROCESSING** is the transformation of raw plant or animal materials, such as grains, produce, meats, and dairy, into other food products. Today we are going to practice processing some of our own food!"

"We will make our own butter, just like traditional societies have done for about 4,000 years!"

"What do we depend on for the availability of butter?"

Desired answer: Cows, land for grazing, farmers, food processors, transportation, grocery stores and markets.

"How can we be more self-sufficient?" Desired answer: Raise cows or support local farmers and dairies, and make the butter ourselves!

"Colonial Americans made butter using butter churns. We are going to use jars."

"The more care we put into the making of our food, and the closer it is to the source (its place of origin), the better it tastes! We will also harvest, wash, chop, and add herbs from the garden in order to enjoy their flavors and health benefits. We must wash our hands thoroughly with soap and water before making and eating our food."



Antique butter churn

### GROUP ACTIVITIES OVERVIEW

"In the garden today one group will practice a traditional food processing skill, making butter, and the other will care for the garden, then we will switch."

#### Garden Agreements

Have students take a deep breath, then review the Garden Agreements:

- I will be **SAFE**
- I will be **KIND**
- I will have an **OPEN MIND**
- I will use my **TIME WELL**



Divide the students into two groups before going outside.



## GROUP ACTIVITIES

20 MINUTES

Rotate groups after 10 minutes. Regroup for closing.

### TRADITIONAL FOOD PROCESSING SKILLS (10 minutes)

**Students must wash hands thoroughly with soap and water before participating in this activity.**

#### Herb Harvest:

Have two or more students harvest, wash, and cut up fresh herbs from the garden (using clean scissors) to add to the butter (small amounts, about 2 leaves each, of basil, dill, and rosemary).



Have students take turns reading the directions on the Butter Making Instructions Sign.

#### Instructions for Making Butter:

1. Have students stand or sit in a circle over the grass (not concrete, in case the jar falls).
2. Add about 1/2 cup (1/4 pint) organic heavy whipping cream to a jar with a tight fitting lid (about 1/2 full; no more than 2/3 full).
3. Shake the jar vigorously and continuously for about 5 to 10 minutes, one shake per second (each student can have about 10 shakes before rotating). Use both hands.
4. Keep shaking until the cream separates completely into the butter (a large yellow, solid clump) and liquid buttermilk (past the whipped cream stage).
5. Pour off the liquid into the other jar and place the butter into the small container with lid.
6. Press the remaining buttermilk out of the butter using the wooden spoon.



7. Pour off any remaining buttermilk into the buttermilk jar and refrigerate. Use for pancakes, muffins, etc.
8. Add salt (about 1/4 tsp.) and finely chopped herbs to the butter. Blend well with spoon.



**Students may enjoy their snack after both groups have rotated through the two activities (butter making and garden care).**

### GARDEN CARE (10 minutes)

1. Review the importance and presence of biodiversity by noticing the variety of characteristics among the garden plants. "Which plants would you choose seeds from for the next generation?"
2. Thin the squash plants so that there is only one healthy plant per 12 inches in each row (squash seeds were planted two per hole). Carefully pull out the extra plants, being careful not to disturb the roots of the remaining plants. Or use scissors to carefully cut the smaller/less robust squash plants (one from each pair) off at the base near the soil. Thinning will help the remaining plants thrive best with adequate access to space, sun, water, nutrients, and air flow.
3. Use hands or clamshells to mound the soil around the base of each corn plant so that they stand up straight with no roots exposed.
4. Add about 1 cup of vermicast to the garden. If the vermicast is moist, dissolve it in water and water the soil with the nutrient-rich water. If the vermicast is dry, sprinkle it over the soil and mix it in lightly.
5. Optional: Add a handful of compost to the base of each plant and gently mix into the soil. Place mulch over bare soil.
6. Water, weed, and fertilize the herbs with vermicast and compost (optional).



## CLOSING AND SNACK

10 MINUTES

**All students must wash their hands thoroughly with soap and water after working in the garden and before enjoying their snack.**

Have the students be seated in a circle near the garden. Ask them to share about their experience.

Discuss with students:

- Describe several ways in which we are **DEPENDENT** on others.
- How did you practice **SELF-SUFFICIENCY** today?
- What other **FOOD PROCESSING** skills would you like to learn?

After washing hands, enjoy the snack with students. Have students share what they are thankful for before eating. Each student may take one cracker at a time; an adult should serve the butter to students using a butter knife.

“Please continue to water and visit your gardens every day! In our next lesson we will have a Harvest Party and make a Three Sisters Stew!”

Have students place any left over garden herbs in a bucket and then add it to the school's compost pile when finished. Do not add butter and cracker snack waste to the compost pile.



## FOLLOW UP GARDEN CARE

**Follow Up Garden Care is the responsibility of the classroom teacher and students.**

- Continue to have the Garden Monitors visit the gardens daily to water and complete the class' Garden Journal entry.
- Remove weeds from in and around the garden bed.
- As the corn plants grow, mound soil around the base of the stem to help them stand upright.
- If the squash are ready to harvest before Lesson 4, preserve them by harvesting, washing, chopping, blanching (immersing for 1 minute in boiling water), draining, and freezing. Defrost and use during Lesson 4.
- Students must wash their hands thoroughly with soap and water after working in the garden.





## FOLLOW UP ACTIVITIES

**Follow Up Activities are the responsibility of the classroom teacher.**

- Have students complete the Real Local Meal Student Worksheet.
- Have students make daily or weekly garden observations and journal entries including notes, drawings, poems, stories, etc.



## LESSON EXTENSIONS

### **The Food System**

(5.W.7, 5.SL.1, 5.SL.5)

1. Have students research and discuss different philosophies and practices of growing and processing food, comparing traditional, self-sufficient societies (e.g., early Hawai'i and Native America) with the present-day globalized food system.
2. Discuss as a group your individual and collective visions for a healthier way to raise, process, and eat our foods for the health of people and the planet.
3. Research what bills at the legislature relate to Hawai'i's food system and self-sufficiency.
4. Write letters to the principal, school newsletter, local newspaper, or local legislators with your ideas.
5. Create posters to display on campus.

### **Community Self-Sufficiency**

(5.W.1, 5.SL.1, 5.SL.4)

1. Discuss what external factors we depend on for water, energy, transportation, and waste.
2. Tour the school campus with pencils and journals, drawing and recording ideas for how the school could contribute to your community's increased self-sufficiency (e.g., food, water, energy, transportation, waste).
3. Have students develop their ideas into opinion pieces on the topic that they present to the class.







## KEY TERMS AND CONCEPTS

**Dependent** - Relying on someone or something else for aid or support

**Food Processing** - The transformation of raw plant or animal materials, such as grains, produce, meats, and dairy, into other food products

**Self-Sufficiency** - Able to supply one's own needs without external assistance

**Traditional** - Information, customs, beliefs, etc. handed down for generations

**Directions:** Use this space to record your notes, drawings, and observations,



Student Worksheet  
**THE THREE SISTERS GARDEN**  
Lesson 3 \* Self-Sufficiency

Name .....

Class ..... Date .....

## A REAL LOCAL MEAL



**Directions:** Fill in your answers to the questions below.

1. About how much of Hawai'i's food is currently imported from out of state? \_\_\_\_\_

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2. How does the imported food get to Hawai'i? \_\_\_\_\_

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3. List the places where can you find (harvest or buy) food that is grown in Hawai'i. Create a mini-map of these places in relation to where you live.

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4. Imagine that one day there is no more imported food. What would you eat for breakfast, lunch, and dinner, and where would your food come from? \_\_\_\_\_

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## DESCRIPTION

Students will discuss the importance of working as a community, then put theory to practice as they harvest, wash, chop, and cook their vegetables and herbs, creating a delicious and nutritious Three Sisters Stew for all to share and enjoy at the Harvest Party. They will remove the remaining garden plant parts, chop them and place them as mulch over the soil, putting the garden bed to rest for the summer.

**TIME:** 55 minutes\*\*

**SUBJECTS:** Health, Social Studies

## LEARNING OBJECTIVES

After this lesson students will be able to:

- Work as a community to create a delicious and nutritious meal using fresh vegetables.
- Harvest, wash, chop, and cook fresh vegetables and herbs.
- Describe the significance of the Three Sisters planting method and the importance of biodiversity in gardens.

## ACADEMIC STANDARDS\*

**CCSS, Language Arts:** 5.W.3, 5.W.10, 5.SL.1

**HCPS III:** HE.3-5.1.3, HE.3-5.1.8, SS.5.2.1

**NGSS:** 5-LS2-1, Developing and Using Models, Patterns, Systems and System Models

**Lesson Extensions:** 5.SL.5, HE.3-5.6.1, HE.3-5.6.2, HE.3-5.6.3

## LESSON OUTLINE

- I. Introduction (15 minutes)
  1. Working as a Community
  2. Group Activities Overview
- II. Group Activities (30 minutes)
  1. Garden Harvest
  2. Corn, Beans, Squash Prep
  3. Herb Harvesting and Cutting
  4. Cooking/Serving
- III. Harvest Party (10 minutes)\*\*



## KEY TERMS AND CONCEPTS

**Community** - A social group whose members reside in a specific locality, and share government or common characteristics, interests, culture, and/or historical heritage

**Mindful** - Conscious or aware of something



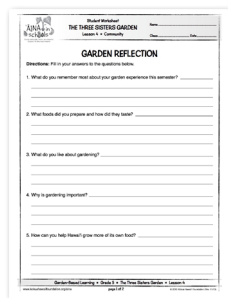
\*\*Note: This lesson is designed so that the Introduction and Group Activities take place within 45 minutes. If time permits, the Harvest Party may be extended and multiple classes and invited guests (parents, administrators, etc.) may gather to enjoy the celebration together.



## LESSON MATERIALS

### Community Supplies:

- Harvest basket
- Blue painter's tape (for marking seeds to save)
- Measuring spoon set
- Measuring cup set (for measuring and serving)
- 4 bowls/colanders (for washing and placing cut herbs, vegetables, and corn kernels)
- 4 clean scissors (for cutting herbs and beans)
- 4 plastic serrated knives ("lettuce knives"; 2 for scraping corn off the cob, 2 for cutting squash)
- 2 cutting boards
- Salt
- Induction heater (cooktop)
- Extension cord
- Cooking spoon (for stirring stew)
- 30 spoons and/or forks (washable)
- Sponge and soap
- Dishtowel (for cleanup)



Student Worksheet: Garden Reflection

THE THREE SISTERS GARDEN  
Lesson 4 \* Community

GARDEN REFLECTION

Directions: Fill in your answers to the questions below.

1. What do you remember most about your garden experience this semester?
2. What foods did you prepare and how did they taste?
3. What do you like about gardening?
4. Why is gardening important?
5. How can you help Hawaii? Give some of the best ideas!

Don't forget to bring your completed worksheet to class!

Student Worksheet:  
Garden Reflection

### Lesson Supplies:

- Group Activity Cards (6): Garden Harvest, Corn Prep, Bean Prep, Squash Prep, Herb Cutting Instructions, Three Sisters Stew Recipe
- Garden Agreements Sign
- Vegetable bouillon cubes (3 per class)
- Cups for serving stew (biodegradable or washable, 1 per student)
- Student Workbook

### Teaching Team To Provide (with reimbursement for groceries, if needed):

- Fresh vegetables needed: 5 ears corn, 12 oz. beans, and 2 medium summer squash per class; harvest from the garden and supplement with purchased produce if necessary
- Large pot with lid (MUST HAVE MAGNETIC BOTTOM for use with induction heater; test by sticking a magnet to the bottom)

### School To Provide:

- Garden Journals (1 per student if not using Student Workbooks)
- 2 tables (4 to 6 feet long, 1 for chopping, 1 for cooking and serving)
- Electric outlet
- 2 pairs loppers or clippers; 6 pairs garden gloves
- Bucket for collecting snack waste

## ACCOMPANYING DOCUMENTS

- 'ĀINA Post-Unit Survey
- Guided Notes
- Three Sisters Stew Recipe Sign
- Student Worksheet: Garden Reflection
- Harvest Party Invitations

## ADVANCE PREPARATION

- Discuss lesson preparation and presentation plans with your teaching team.
- If parents and administration are being invited to attend this lesson, print, cut, and send Harvest Party Invitations home with students one week before the lesson.
- Make copies of the 'ĀINA Post-Unit Survey and Student Worksheet, one per student if not using the Student Workbook.
- Optional: Purchase any necessary fresh, locally grown vegetables (corn on the cob, green beans, zucchini squash), to supplement school garden produce (see quantities at left).
- Locate a work area with access to electricity and 2 tables (4 to 6 feet long) for use during the lesson.
- Set up the tables and stations for the Harvest Party.
- Have students ready to take notes in their Student Workbooks or Garden Journals.



Harvest Party Invitations

THE THREE SISTERS GARDEN  
Lesson 4 \* Community

YOU'RE INVITED TO OUR GARDEN HARVEST PARTY!

Please join us as we celebrate and enjoy our beautiful garden harvest!

Harvest Party Invitations

## INTRODUCTION

**15 MINUTES**

Invite students to share some observations they have made in the garden. During the discussion, write key terms on the board and have students take notes in their Student Workbooks or journals.

“Today is our Harvest Party! We will harvest the vegetables from your garden to make a Three Sisters Stew that we will enjoy together.” Discuss briefly with students about how the garden grew. What went well and what might they do differently next time to help it grow even better?

### WORKING AS A COMMUNITY

“During our Harvest Party, we will work together as a COMMUNITY. What does this word mean to you?” Accept a few student answers.

“In a healthy community, each person does their job and the whole community benefits. Native Americans, Colonial Settlers, and Native Hawaiians had to do this well in order to survive using the resources available to them. So do we.”

### GROUP ACTIVITIES OVERVIEW

“Today you will be assigned to a station; do your best and help each other! When you finish, see where else you can be of help so that the entire job gets done. Let’s remember to be grateful for the abundance that we receive. Practice being MINDFUL by giving your full attention and awareness to what you are doing.”

Give a brief explanation of each station and assign students to the six different stations before leaving the classroom. Each station will receive a Group Activity Guide that contains their instructions.

Emphasize that all stations, especially cooking and cutting, require mindful attention and care. Assign the students to the different stations by counting them off, or allow them to choose their desired station, or ask for the teacher’s assistance.

“Remember that the more mindful we are when making our food, and the closer it is to the source (its place of origin), the better it tastes!”

### Stations:

1. Garden Harvest: Observe and select one or more corn ears and bean pods to mark with blue painter’s tape, leave on the plants, allow to dry, and save for seeds. Harvest corn, beans, and squash; remove and chop plants (remind students to use two hands to gently harvest the garden vegetables, e.g., hold corn and twist off the stalk).
2. Corn Prep: Remove corn husks and tassels; cut off the corn kernels for the stew.
3. Bean Prep: Wash and cut the beans.
4. Squash Prep: Wash and chop the squash.
5. Herb Harvesters and Cutters: Harvest, wash, and cut garden herbs: basil, rosemary, dill.
6. Cooks and Servers: Cook the stew according to the instructions; serve it into cups.

### Hand out the six Group Activity Cards.



### Garden Agreements

Have students take a deep breath, then review the Garden Agreements:

- I will be SAFE
- I will be KIND
- I will have an OPEN MIND
- I will use my TIME WELL



**Have all students wash their hands with soap before going outside, even the harvesters.**



## GROUP ACTIVITIES

30 MINUTES

**All students must wash hands thoroughly with soap and water before participating in these activities. Have students read the instructions on their Group Activity Card before starting.**

**Garden Harvest:**

- Select one or more corn ears and bean pods to leave on the plants, allow to dry, and save for seeds. Mark them each with a piece of blue tape so they will not be harvested.
- Harvest the rest of the corn, beans, and squash from the class' garden.
- Take vegetables to their prep stations.
- Clip/chop/shred the remaining vegetation; leave any plants that are still producing food.
- Cover the garden soil with the clippings (mulch) so that the soil is protected from the sun.
- Water the garden well.

**Corn Prep:**

- Shuck the corn (remove the corn husks and tassels and put them in a pile for compost).
- Use cutting boards and plastic knives to scrape the kernels off the corncobs into a bowl and bring to the cooking station.

**Squash Prep:**

- Wash squash well.
- Use cutting boards and plastic knives to cut the squash into small pieces, put them into a bowl, and bring them to the cooking station.

**Bean Prep:**

- Wash the beans well.
- Snap off the ends and put the ends into a pile for compost, then use clean scissors to cut the beans into small pieces over a large bowl and bring them to the cooking station.

**Herb Harvesting and Cutting:**

- Harvest rosemary, basil, and dill from the garden.
- Wash and cut them into small pieces over a bowl using scissors.
- Take chopped herbs to the cooking station.

**Cooking/Serving:**

- Read the recipe and cook the Three Sisters Stew according to the instructions provided. Once the vegetables are chopped, begin by heating 3 cups water; add and dissolve the bouillon cubes. Add the corn, beans and squash together. Cook 4 minutes, then add remaining water (3 cups), herbs and salt. Cook 3 to 5 more minutes. Servers need to count the number of people to be served, prep the cups and serve 1/2 cup full of the stew into the cups with spoons or forks, making sure there is enough for all.

**Cleanup:**

- Make sure all students help to cleanup and wash hands before the Closing and Snack.



## HARVEST PARTY

**10 MINUTES**

**All students must wash their hands thoroughly with soap and water after working in the garden and before enjoying their snack.**

If parents and/or staff attend, consider the following options for engagement:

- Place lesson materials on display (e.g., Signs).
- Have students present about what they have learned from The Three Sisters Garden.
- Have students take parents on tours of the garden.
- Sing garden songs together.

Have the students be seated in a circle near the garden. Ask them to share about their experience.

Discuss with students:

- How did you practice working as a COMMUNITY today and how did it feel?
- How did you practice being MINDFUL today and how did it feel?
- Share something you have learned from The Three Sisters Garden.
- What is your favorite ingredient in the stew?

Have the Garden Harvest group share about the plants they selected for seed saving in the garden (one or more corn ears and bean pods marked with blue painter's tape so they will not be harvested until the seeds are mature).



“Just as the three sisters help each other in the garden, they also complement each other nutritionally. Corn provides carbohydrates, the beans are rich in protein, and squash has vitamins and minerals. When eaten together they provide a nutritionally complete meal.”

Ask for students to share what they are thankful for before eating. Have the Cooking/Serving group hand out the cups with stew and spoons or forks. Help students practice MINDFUL eating:

- Take a deep breath in and out.
- Sense how you are feeling before eating.
- Take small bites.
- Taste and feel each bite in your mouth.
- Go slowly and take your time while chewing.

### After-Snack Cleanup:

- Be sure that all students help clean up.
- Have students wash the forks and spoons with sponge, soap, and water.
- Have students rip up the cups (for quicker composting) and place them in the school compost bin.
- Have students place snack waste in a bucket and then add it to the school's compost pile when finished.
- Make sure all stations are tidy and materials are put away.



Squash flowers are edible too!

## FOLLOW UP GARDEN CARE

**Follow Up Garden Care is the responsibility of the classroom teacher and students.**

- This is the final lesson of the semester so it is time to put the garden to rest. Use mulch materials to cover the soil, protecting it from the sun and discouraging weeds.
- Continue to have your students water and visit the garden at least once a week to help keep the soil alive and to harvest any remaining produce and seeds. Students must wash their hands before

harvesting. Garden produce must be washed before being eaten.

- Harvest, dry, and save seeds from the plants marked with blue painter's tape in the garden (by Garden Harvest group). Keep them for future garden plantings or send them home with students to plant gardens with their families.
- Students must wash their hands thoroughly with soap and water after working in the garden.
- Plan with other teachers and families for use of the gardens during the winter/summer break.

## FOLLOW UP ACTIVITIES

**Follow Up Activities are the responsibility of the classroom teacher.**

- Review this semester's garden experience with students, including key concepts for the unit, which are 'āina, food miles, food security, companion plants, biodiversity, agriculture, crop varieties, seed selection, seed saving, dependence and self-sufficiency, food processing, community, mindfulness, proper harvesting and food handling, and gardening and culinary arts.
- Administer the 'ĀINA Post-Unit Survey



immediately following the final lesson.

- Have students complete the Garden Reflection Student Worksheet.
- Have students create a final journal entry about their garden experience this semester. Have them share their work with the class.
- Save and submit examples of student work to Kōkua Hawai'i Foundation.

Student Worksheet:  
Garden Reflection

## LESSON EXTENSIONS

### Forming Healthy Habits

(5.SL.5, HE.3-5.6.1, HE.3-5.6.2, HE.3-5.6.3)

1. Have students envision and list the elements of a healthier Hawai'i: What decisions would we need to make differently?
2. Have students name a personal health goal and describe a plan to achieve it (especially with respect to growing gardens, exercising, and eating fresh, locally grown foods).

3. Discuss with students how they might share what they have learned about gardening and eating close to the source (fresh and locally grown) foods with their friends, families, and their school community. Create cards, posters, songs, stories, poems, videos, etc. for this purpose.





Guided Notes

# THE THREE SISTERS GARDEN

Lesson 4 \* Community

Name .....

Class ..... Date .....

## KEY TERMS AND CONCEPTS

**Community** - A social group whose members reside in a specific locality, and share government or common characteristics, interests, culture, and/or historical heritage

**Mindful** - Conscious or aware of something

Directions: Use this space to record your notes, drawings, and observations.



## THREE SISTERS STEW RECIPE

### Ingredients

- 6 cups water
- 3 vegetable bouillon cubes
- 3 cups fresh corn kernels (about 5 ears)
- 3 cups beans chopped in 1/2 inch pieces
- 2 cups summer squash chopped in 1/4 inch pieces
- 1 tsp chopped fresh dill (optional)
- 1 tsp chopped fresh rosemary (optional)
- 1 tsp chopped fresh basil (optional)
- 1 1/2 tsp salt



### Supplies

- Stove or portable burner
- Large pot with lid
- Measuring cups
- Measuring spoons
- Wooden spoon
- Cups for serving (washable/biodegradable)
- Forks/spoons (washable)





Student Worksheet  
**THE THREE SISTERS GARDEN**  
Lesson 4 \* Community

Name .....

Class ..... Date .....

## GARDEN REFLECTION

**Directions:** Fill in your answers to the questions below.

1. What do you remember most about your garden experience this semester? \_\_\_\_\_

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2. What foods did you prepare and how did they taste? \_\_\_\_\_

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3. What do you like about gardening? \_\_\_\_\_

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4. Why is gardening important? \_\_\_\_\_

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5. How can you help Hawai'i grow more of its own food? \_\_\_\_\_

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Student Worksheet  
**THE THREE SISTERS GARDEN**  
Lesson 4 \* Community

Name .....

Class ..... Date .....

6. What are the benefits of working together as a community? \_\_\_\_\_

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7. Describe the feelings you experienced while working as a community with your class. \_\_\_\_\_

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8. What is the most meaningful lesson you learned from the Three Sisters Garden? \_\_\_\_\_

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9. Name one thing you learned that you will teach your family to do: \_\_\_\_\_

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10. Draw a picture of your most memorable gardening experience this year:





You're invited to our

## GARDEN HARVEST PARTY!

Date: .....

Time: .....

Place: .....

Please join us as we celebrate and enjoy  
our bountiful garden harvest!

[www.kokuahawaiiifoundation.org/aina](http://www.kokuahawaiiifoundation.org/aina)



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Student Worksheet
   
**THREE SISTERS GARDEN**
  
 Grade 5 \* Post-Unit Survey

Name .....

School .....

Teacher .....

I have been at this school since grade: K 1 2 3 4 5 (circle one)

1. The Three Sisters Garden is a gardening method used by Native Americans. Which of these plants make up the Three Sisters Garden? Circle the three plants:



a. Corn



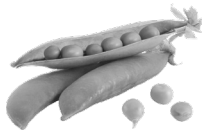
b. Basil



c. Sweet Potato



d. Squash



e. Peas



f. Lemon



g. Carrots



h. Pole beans

2. What are the reason(s) for planting companion plants? Circle ALL the correct answers:

- |                                     |                         |
|-------------------------------------|-------------------------|
| a. Provides nutrients to each other | c. Helps conserve water |
| b. Provides shade                   | d. Repels pests         |

3. What are the use(s) for herbs? Circle ALL the correct answers:

- |                      |                    |
|----------------------|--------------------|
| a. Flavoring foods   | d. Keep pests away |
| b. Medicine          | e. Fragrance       |
| c. Food preservation |                    |

4. Draw a line to match each word to its correct definition:

- |                     |   |
|---------------------|---|
| a. Biodiversity     | 1. The availability of food and one's access to it                          |
| b. Self-sufficiency | 2. The diversity of life within species, between species, and of ecosystems |
| c. Crop Varieties   | 3. Cultivated forms of plants each bearing certain characteristics          |
| d. Food Security    | 4. Able to supply one's own needs without external assistance               |

5. Approximately how much of Hawai'i's food is imported from out of state? Circle ONE answer:

- |            |            |        |            |
|------------|------------|--------|------------|
| a. 10%-15% | b. 25%-30% | c. 50% | d. 80%-90% |
|------------|------------|--------|------------|



6. Do you like gardening? Circle ONE answer:

- a. I do not like                      b. unsure                      c. I like a little                      d. I like a lot

7. Do you like eating fruits and vegetables? Circle ONE answer:

- a. I do not like                      b. unsure                      c. I like a little                      d. I like a lot

8. Do you like cooking? Circle ONE answer:

- a. I do not like                      b. unsure                      c. I like a little                      d. I like a lot

9. Do you like making compost? Circle ONE answer:

- a. I do not like                      b. unsure                      c. I like a little                      d. I like a lot

10. Do you like 'ĀINA Lessons? Circle ONE answer:

- a. I do not like                      b. unsure                      c. I like a little                      d. I like a lot

11. Do you and your family grow any food at home? Circle: Yes or No

If yes, please list the foods you grow at home: \_\_\_\_\_

12. Do you compost at home? (compost pile, worm bins, or bokashi bucket) Circle: Yes or No

13. How often do you eat fruits and vegetables? Circle ONE answer:

- a. I don't eat fruits and vegetables      b. 1-2 times a week      c. 3-5 times a week      d. Every day

14. Circle the fruits and vegetables that you like to eat:

Apple    Cantaloupe    Banana/Mai'a    Blueberries    Avocado    Coconut/Niu    Guava    Dragonfruit  
Mango    Passionfruit/Liliko'i    Honeydew    Rambutan    Tangerine    Strawberry    Blackberries  
Lemon    Starfruit    Breadfruit/'Ulu    Lychee    Orange    Papaya    Pineapple    Watermelon  
Radish    Spinach    Basil    Beans    Broccoli    Squash    Zucchini    Sweet Potato/'Uala    Corn    Tomato  
Lettuce    Watercress    Taro/Kalo    Cucumber    Green Beans    Asparagus    Carrots    Celery    Kale

Other: \_\_\_\_\_

15. Describe what 'āina means to you: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

16. List two ways that you take care of the 'āina:

1. \_\_\_\_\_  
2. \_\_\_\_\_

17. Complete the following sentence:

My favorite thing about 'ĀINA In Schools Lessons is \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_